GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA

UNSTARRED QUESTION NO:3836
ANSWERED ON:09.08.2017
Nano Mission
Gandhi Shri Feroze Varun

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether the Government has launched Nano Mission to promote Research and Development in Nano Science and Technology;

(b) if so, the details thereof including funds allocated, funds utilized, R&D projects undertaken and their output during the last three years and the current year;

(c) whether the Government is considering to formulate national level regulatory framework for Nano-technology; and

(d) if so, the steps being taken by the Government for the development of Nanotechnology and physical and human infrastructure in this sector?

Answer

MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE IN THE MINISTRY OF EARTH SCIENCES
(SHRI Y.S. CHOWDHARY)

(a) Yes, Madam.

(b) The Govt. of India launched Nano Science and Technology Initiative (NSTI) in October 2001 to promote Research & Development (R&D) in Nano Science and Technology (NS&T). NSTI was a modest programme. On 3rd May 2007, the Government of India launched the Nano Mission, as a major "umbrella capacity-building programme", anchored in DST. Its objectives can be broadly classified as follows:

â€¢ Basic Research Promotion.
â€¢ Infrastructure Development for Nano Science & Technology Research.
â€¢ Nano Applications & Technology Development Programmes.
â€¢ Human Resource Development.
â€¢ International Collaborations.

Nano Mission has completed its Phase-I & II and in the current 14th Financial Cycle extended till 2020.

Details of funds allocated and utilized by Nano Mission during the last three years and the current year is given Table No. 1. The number of R&D projects funded during the said period is given in Table No 2.

Table No. 1 Funds allocated and utilized during last three years

Sr. no	Financial Year	Funds Allocated (Rs. in crore)	Funds Utilized (Rs. in crore)
(1)	(2)	(3)	(4)
1.	2014-15	65.00	64.75
2.	2015-16	85.00	83.60
(1)	(2)	(3)	(4)
3.	2016-17	125.00	123.66
4.	2017-18	136.00	75.60
Total		411.00	347.61

Table No. 2 Number of R&D projects funded

Sr. no	Financial Year	Number of projects
1.	2014-15	38
2.	2015-16	56
3.	2016-17	67

4. 2017-18
(as on 02.08.2017 20
Total 181

The duration of most of the projects is 3-years, and for a few major projects, it is 5-years. The projects start giving outputs from the 2nd year onwards after the R&D work advances to some extent. Output from projects funded during 2014-17 will, therefore, start showing growth from 2017-18 onwards. However, the output from these projects recorded so far is as follows- 8 PhDs produced/ ongoing; 138 technical personnel trained; 550 research papers published and 17 patent filed.

Some of the important research results from these projects are given below:

â€¢ Continuous microreactor based platform for the synthesis of polymeric nanoparticles based on the principle of nano precipitation and solvent emulsification has been developed. A library of polymeric nanoparticle using Poly lactic-co-glycolic acid (PLGA) and Poly methyl methacrylated (PMMA) of different sizes having uniform dispersity have been synthesized.
â€¢ MoO3 prepared via sonochemical method shows very good lithium ion battery performances. Copper doped TiO2 nanomaterials prepared via sonochemical method showed good hydgrogen generation via photocatalytic water splitting reaction using solar light as a source.
â€¢ In a study progress has been made towards physical understanding of charge transfer. Advances made towards understanding charge transfer on the nanoscale. Silver nano rods have been synthesised using a soft template based structure copying method.
â€¢ Sunscreen with high sun protection factor (SPF) and less chemical sunscreen ingredient concentration with bioactive-dendrimer complex has been developed and is ready for preclinical evaluations of dendrimeric sunscreen screams.
â€¢ In a study for development of titania aerogel photo anode for dye sensitized solar cell (DSSC) application, Titania aerogel based DSSC achieved efficiency of 4-4.5% which is better compared to standard powder.
â€¢ New borohydride synthesis technique have been developed which has the inherent advantage for forming porous zirconia nanopowders and the porous nature which are stable up to 800 oC.

(c) The process of laying down a Roadmap for Regulatory Framework for Nanotechnology in India has already been initiated in consultation with concerned Ministries. A set of safety guidelines for workers in laboratories has been developed and posted on the Nano Mission website www.nanomission.gov.in for public use.

(d) For the development of physical and human infrastructure in Nano Technology, the Nano Mission has supported a variety of programmes such as individual scientist centric projects, Units on Nano Science, Centres of Nano Technology, Thematic Units of Excellence, Centre for Computational Materials Science, Thematic Projects in Frontiers of Nano Science & Technology, Joint −Institute-Industry linked projects, Proof-of-Concept projects, Post Graduate programmes and Post Doctoral Fellowship in Nano Science and Technology, Visiting Associateships and Overseas Visiting Fellowships, international collaborations, etc to promote novel research and innovation in nano science and technology.

As a result of the lead taken by the Nano Mission, India has very good research facilities for pursuing research in nano science and technology and India today is placed 3rd in the world in terms of scientific publications.

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